Notebook Series -- Notebooks by Edison and Other Experimenters
Recorder and Recording Experiments -- Miscellaneous Books
Notebook, N-16-07-03.2

This notebook was used during July -October 1916 and January-May 1921 by Edison, Absalom M. Kennedy, George J. Werner, and possibly other experimenters for notes on experimental recordings. In the first part of the book, details of recording sessions from 1916 are provided by Kennedy and Werner. Some of these entries contain comments by Edison, while others mention Edison's verbal remarks or instructions. This section ends with an undated note from Edison to Walter H. Miller, head of the Recording Division. The second part of the book, containing entries by Werner from 1921, begins with the title page: "Record of Recorders for Columbia St. Studio." Included are detailed drawings of numbered recorders, along with notes indicating verbal comments by Edison. Inserted into the book are notes from 1914-1916, some by employee F. C. Burt, which were apparently removed from one or several notebooks, along with additional items from 1921. The front cover is labeled "Record of Recorders For Columbia St. Studio. G.J. Werner." The book contains approximately 50 unnumbered pages followed by 60 numbered pages. At least one page was removed from the book before the pages were numbered.

~~Visitors Tests~~

67150
Acme Co.,
MFG. STATIONERS,
96 JOHN ST.
AND
19 PLATT ST.
NEW YORK.

7/3/16

~~C1~~ – Large sheet horn compared with cast horn.
Recorders 109 & 121.
Violin solo
Distance 12" in each case.

~~C2~~ – Large sheet compared with cast horn.
Rec. 132 & 122.
Violin solo.

~~C3~~ – Large compared with cast.
Rec. 130 & 108
Violin solo.

~~C4~~ – Comparing back & front of violin toward cast horn.
(1) at 18"
(2) " 36"
Rec. 109

~~C5~~ – (1) Comparison of front & back of violin at 5 ft. from Cast Horn.
Rec. 109.
(2) Comp. of violin at 6 ft. from Cast horn & at 1 ft. from large horn.
Rec. 109

7/7/16.

~~C6~~ – Recorders 130–100 – 118.

Test of Piano & Violin solos.
Large Horn

C7 – Recorders 108 – 132 – 129 – 103.

Test – Piano & Violin solos.

Large horn

~~C8~~ – Recorder 123

Test – Piano & Violin solos

Large horn.

C9 – Recorder Test. — 7/12/16.

132 – 100 – 129 – 103
Large Horn

~~C10~~ Recorder Tests — 7/12/16.

108-130-127-123-104-118.
Large Horn.

~~C11~~ Recorder tests. 7/12/16

117-115-107
Large Horn.

~~C12~~ Recorder tests 7/14/16
132-134-120-107-
Large Horn

~~C13~~ Recorder Tests 7/18/16

132-131-102-134-109-121

Large horn.

~~C14~~ Recorder tests 7/18/16

113

Large horn

~~C15~~ — Recorder tests 7/20/16

126 — 128 — 106 132

Large horn.

~~C16~~ Recorder tests — piano 7/22/16

Std. 63 — [illegible]

~~C17~~ R. tests — piano

R. 132 — 128 — 126

~~C18~~ R. tests — piano

R. 113 — 121 — 106

~~C19~~ R. tests — piano

R. 105 — 130 — 129

✓(C 20) Recorders without str. disc
violin

R. 132-122-114-110

✓C 21 — Recorders with other disc
violin

~~C 22~~ Recorder tests — piano

R. 132-131-127-103-104-127

7/28/16

~~C 23~~ - Recorder tests - piano

R-100-102-117-120-118-134

7/28/16.

~~C27~~ Recorder tests - piano

R. 113-107-128-106-105-126

7/28/13

~~C25~~ - Recorder tests - piano

R. 130-129-109-103-121-115

7/28/13

~~C26~~ Recorder tests - piano

R.-110-122-114.

7/28/13

~~C27~~ Rec. tests - player piano

132-120-118-105-100-123

~~C28~~. Rec. tests - player piano

132-102-103-127-131-104-107

~~C29~~. Rec. tests - player piano

132-106-122-110-125.

~~30~~ Rec. tests - player piano

132 - 129 - 130 - 117 - 115

~~31.~~ Rec. tests - player

132 - 113 - 126 - 122 - 103 - 109

~~32.~~ Harm. tests - with & without reflector

Rec. 113

~~33.~~ Test with & without reflectors.

Violin at 10".

~~34~~ Recorder tests - piano

100 - 102 - 103 - 104 - 105 - 106

~~35~~ Recorder tests - piano

128 - 129 - 130 - 131 - 132 - 50

~~36.~~ Recorder tests - piano

107 - 108 - 109 - 110 - 113 - 114 - 115

~~37.~~ Recorder tests — piano

117-118-120-121-123-126-127

~~38.~~ Recorder tests — violin

[illegible]-103-104-105-106-107-108-

~~39.~~ Recorder tests — violin

120-121-123-126-127-128-129

~~40.~~ Rec. tests — violin

130-131-132-50

~~41.~~ Rec. tests — violin

109-110-113-114-115-117-118

~~42.~~ Resp. larger, small horn — violin.

Sept. 22/16

43. Piano with Player attachment
To determine opening of piano.

12' ~~distant~~ Opening 1 panel wide

① - 1" wide
② - 3" "
③ - 5" "
④ - 7" "
(1) - 9" "
② - 11" "
③ - 13" "
④ - 15" "
① - 17" "
② - 21" "
③ - 25" "
④ - 29" "
① - 33" "
② - 46" "

12' Distant Opening 3 panels wide

③ - 1" - wide
④ - 3" "
① - 5" "
② - 7" "
③ - 11" "
④ - 15" "
① - 19" "
② - 23" "
(3) - 30" "
(4) - 40" "

(44) - Piano 6' distant, opening 1 panel

① - 1"
② - 3"
③ - 5"
④ - 7"
⑤ - 9"
⑥ - [illegible]"
⑦ - [illegible]"
⑧ - 15"
⑨ - 17"
⑩ - 20"
⑪ - 24"
⑫ - 30"
⑬ - 40"

6' Distant, 3 [illegible] opening

① - 1"
② - 3"
③ - 5"
④ - 7"
⑤ - 9"
⑥ - 12"
⑦ - 15"
⑧ - 20"
⑨ - 40"

~~(45)~~ - Experiment with $\frac{1}{4}$" recorders
① - Rec. 1 } Player Piano
② - " 0 } at 12'-9"
1 panel opening.

~~(46)~~ Experiment with $\frac{1}{4}$" recorder
1 panel wide
30" opening at 6'

(47) Exper. with $\frac{1}{4}$" recorder
1 panel wide, 9" high
recorder 0

(48) Rec. 2
Piano. Large horn. Large trumion.
~~Violin " " " "~~
Piano. Large " . Small "
Violin " " " "

H-1 Hawaiian Guitar Duet.
Ellco March
by Mr Lincoln and Robert Naiaialeale
R-126 - 10/20/16.
Hawaiian Guitar - 9 ft from Horn (1-3)
with harmonium reflector over head.
Guitar 10 ft from horn (7-8)

Tune: O.K.
(verbally Mr. E)

H-2 - Mauna Kea
Baritone Solo by Mrs Lincoln
Accompanied by Ford Hawaiian Quartette
R 128 — 10-20-16

1st Bass & Hawaiian Steel Guitar	- 2 ft from horn	(1)
Baritone & Guitar	6" " "	(5)
2nd Bass & Ukulele	9" " "	(8)
Tenor & Guitar	5" " "	(4)

OK WG

H-3 - Tomi-Tomi.
R130 - 10/20/16.

1st Bass & Haw. S.T. Guitar	- 2½ft from horn	①
Baritone & Guitar	- 6" " "	⑤
2nd Bass & Ukulele	- 9" " "	⑧
Tenor & Guitar	- 5" " "	④

H-H On The Beach at Nai-ki-ki
R130 - 10/20/16.

No Bass & Steel Guitar.	3 ft from horn	(1-2)
Guitar & Soloist	4" " "	(4)
Guitar & Tenor	10" " "	(7)
Ukulele & Bass	10" " "	(8)

No - Rag American
type not wanted
want soft slow
Hawaiian or plaintive
Music —

H-5 Pukohana Waltz
Instrumental
R126- 10/28/16.

Steel Guitar 2ft from horn with reflector (1)
1 Guitar 8' (5-2)
2 " 8' (6-1)
Ukulele 10' (8)

OK -

Note Base & high Base is strong and high weak just as all Music should be & just opposite in other records

H-6 The Rosary
Hawaiian Steel Guitar Solo
By Robert Naauaaleale
R 126 - 10/20/16

NO

Gift from Horn #2

H-7 Shelby Plantation
R-130

no Bass + Steel Guitar	2'		(1)	
1st Bass + Ukulele	3'	from horn	(2-4)	Solo Position
	7'	" "	(6)	Quartette Position
Tenor + Guitar	7'	" "	(5-6)	
Baritone + Guitar	7'	" "	(21-5)	

No

H-8

- C & T.

NO

Steel Guitar -	3'	1-2
Guitar & Baritone	7'	5
Guitar & Tenor	10'	7
Ukulele & Bass	14'	26

H-9

Kaena

tenor too strong

Tune OK -

P/30 - 10/21/16

Steel Guitar	8'	1-5
Guitar & Soloist	6'	6

H-10

Ala- Ha- Oe

good –

Omaunger too strong

Ala Ha- Oe

Rich Harmonium

This is much better than the first principally because positions of singers better

Steel Guitar & Ins Bass 2ft ①

Ukulele 15' ②

2 Guitars 10' at ③ & ⑧ – Harmonium 10' at ⑦

H-11

Ka- Maoli

NO - but might be
got OK

Baritone ~~strenuously~~
too loud.

H-12

Ka-Maoli
R130 - 10/23/16

Steel Guitar or Uke Bass	3' -	3
Guitar or Tenor	6' -	6
Guitar or Baritone	10' -	7
Ukulele or Bass	18' -	8

No

H-13-1

Kuni - Opo (My Sweetheart)

R130 - 10/23/16.

Soloist & Guitar	7'	5
2nd Bass & Steel Guitar	3'	3
Tenor & Guitar	6'	6
Bass & Ukulele	10'	8

fair —

H-13-1

Kuu - Ipo (My Sweetheart)
R130 - 10/23/16.

Soloist & Guitar 10' (7)
Steel Guitars & Bass 3' (3)
Tenor & Guitar - 6' (6)
Ukulele & Bass - 10' (8)

H-14-1

Kilima Nacty - Instrumental

R126 - 10/23/16 -

Steel Guitar	3'	3
Guitar #1	10'	8
Guitar #2	10'	7
Ukulele	20'	22

OK

H-14-2

Kilima Waltz

R126 - 10/23/16

Steel Guitar	3'	3
Guitar #1	10'	8
" #2	10'	7
Ukulele	15'	26-29

H-15-1.

Kahokuhele Song

R 130 — announced 1/26

10/23/16.

Tenor & Guitar	7'	6
Baritone & Guitar	10'	7
Mo Bass & S. Guitar	3'	3
Bass & Ukulele	10'	24

H-15-2

Kahokuhele

St. Guitar & No Bass	3'	3
Guitar & Tenor	7'	6
Baritone & Guitar	9'	7
Ukulele & Bass	9'	21

No

H-16-1 Now-loop-beautiful

Nehi - Nehi - Oe

R-130 - 10/23/16.

Steel Guitar & Mandolin	3'	3
Guitar & Tenor (solo not)	8'	6
Guitar & Baritone	10'	7
Ukulele & Bass	9'	4

H-16-2

Nehi-Nehi-Oe

R130 - 10/23/16.

Steel Guitar 2nd Bass	3' -	(3)
Guitar Tenor Solo (Steps forward on odds)	9'	(6)
Guitar Baritone (Steps fwd on low notes)	9'	(5)
Ukulele & Bass	9'	(22)

H-16-3

Mehi-Mehi-Oe
R130 — 10/23/16.

Steel Guitar & 2nd Bass	3	③
Guitar Tenor	8'	⑥
Baritone & Guitar	10'	⑦
Bass & Ukulele	10'	⑧

OK & Chunk but all blubbered up in Chorus

Chorus rattles all out of time & out of tune with their own instruments = If Tenor alone sings without Chorus it will be OK

A-17-1

R130 - Onana 10/23/16.

Steel Guitar	~~Bass~~	3'	3
Ukulele	Bass	10'	8
Guitar	Baritone (Solo)	10'	7
Guitar	Tenor	7'	6

H-17-2

Oncoma

R 130 – 10/23/16.

Steel Guitar & 2d Bass	3'	3
Baritone & Guitar (Solo)	10'	7
Tenor & Guitar	7'	6
Bass & Ukulele	15'	10

OK.

A-18-1

Ahahi-Hoi (Doucheutthee)

R130 - 10/23/16

Tenor Guitar (Solo)	8'	6
Baritone Guitar	15'	9
Bass Ukulele	15'	10
Fo Bass S. Guitar	3'	3

OK —

H-19-1

Kaala

R130 - 10/23/16.

Baritone & Guitar (Solo)	12'	7
Tenor & Guitar	8'	6
~~Bass & Steel Guitar~~	3'	3
Bass & Eukalili	15'	10

OK -

N-20-1

Kahinano

R130 — 10/23/06.

Tenor & Guitar (Solo)	8'	6
Baritone & Guitar	15'	9
Baso & Ukulele	15'	10
2 " & S. Guitar	3'	3

OK

H-21-1

Nilé-Nili-Nai
R130

Bass & Guitar (Solo)	7'	5
Tenor (Falsetto) & Guitar	9'	6-8
Tenor & Ukulele	15'	10
Bass & St. Guitar	3	3

NO

H-22-1

Mokahana

R130 - 10/23/10

Tenor & Solo Guitar	7'	6
Baritone & Guitar	15	9
Bass & Ukulele	15	10
~~B~~ Bass & Steel Guitar	3'	3

OK -

H-23-1

Kohala Marsh-
R126- 10/23/16

Steel Guitar	3'	3
Guitar	10'	6

OK

H-24-1
Maid of Honolulu

R-130 - 10/23/16

Steel Guitar & Tenor	8'	3
Baritone & Guitar (Solo)	14'	9
Bass & Ukulele	15'	10
Tenor (Mandolin) & Guitar	18'	27

No —

Walter Miller —

Look out for the Baritone
he is entirely too loud
& the tenor is weak →

We placed him 15 ft away
& the tenor 3 ft & yet
Baritone is too loud
tell him to sing 1/2 Volume

They interfere badly in
Chorus & the Chorus is
apt to be too loud
take Chorus worker

S

RECORD OF

RECORDERS

for

Columbia St. Studio.

$1\frac{5}{8}$" DIAPHRAGMS.

$\frac{3}{4}$" OPENINGS.

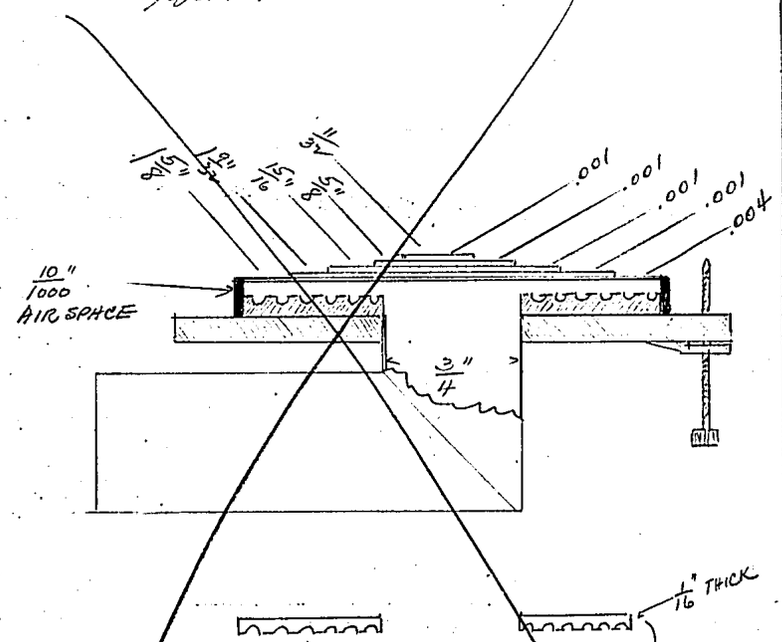
DIAPHRAGM NO. 1.

RECORDER

June 9/2, Test # 43

2/3 [illegible] 1 1/8 1 3/8 1 1/8 7/8

Gasket - .060

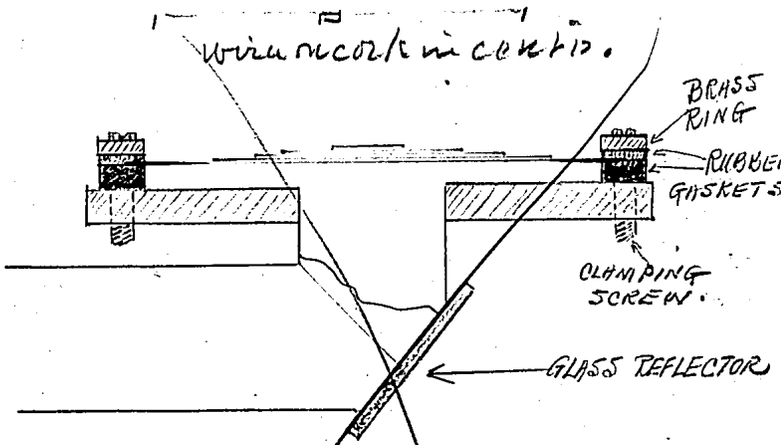


THIS INSERTED IN AIR-SPACE WITH GASKET ON EDGE.

3/4" OPENING - 1 5/8" DIAPHRAGM.

GASKET ON END = .072S

DIAPHRAGM NO. 2
RECORDER



DIAPHRAGM = $\frac{5-8-13\frac{1}{2}-16-18}{1000}$ "#2 THICKNESS

DIAMETERS OF LAYERS = $1\frac{5}{8}$ - $1\frac{9}{32}$" - $\frac{15}{16}$" - $\frac{5}{8}$" - $\frac{11}{32}$"

RUBBER GASKETS = LOWER $\frac{51}{1000}$" THICK, UPPER $\frac{38}{1000}$" THICK
$1\frac{1}{2}$" INSIDE, $1\frac{7}{8}$" OUTSIDE, $\frac{3}{16}$" WIDE.

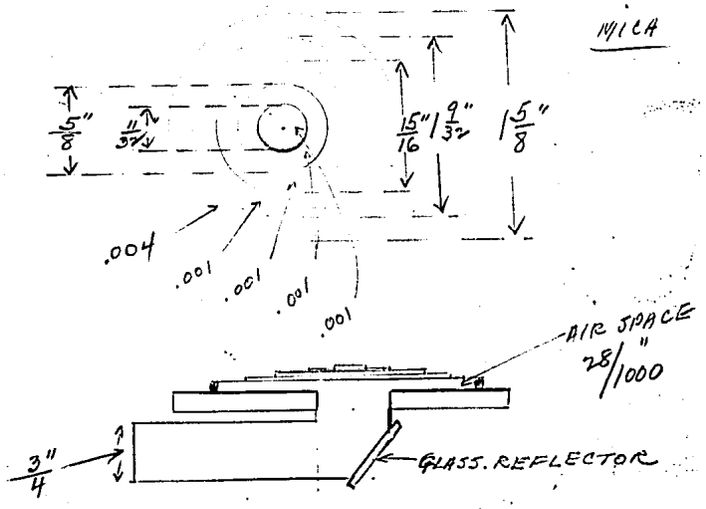
BRASS RING FOR CLAMPING = 9 SCREW HOLES.
$1\frac{1}{2}$" INSIDE, $1\frac{7}{8}$" OUTSIDE, $\frac{1}{32}$" THICK -

Recorder #2.

MAY 5 1921

Paper Fig. same as page 3
Gasket same as page #3
Spring same as #7.

DIAPHRAGM NO. 3.
RECORDER



DIAPHRAGM NO. 4.
RECORDER

DIAPHRAGM NO. 5.
RECORDER

2/7/21

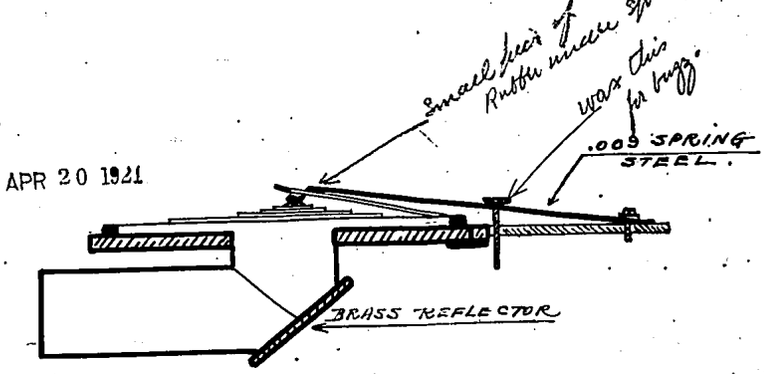
DIAPHRAGM NO. 6,
RECORDER

MICA DIA = 4 - 1 - 1 - 1 - 1 THOUSANDTHS.
GASKET = $\frac{88}{1000}$" THICK $\frac{3}{32}$" WIDE

WITH WIRE CONTROL —

DIAPHRAGM NO. 7.
RECORDER

APR 20 1921

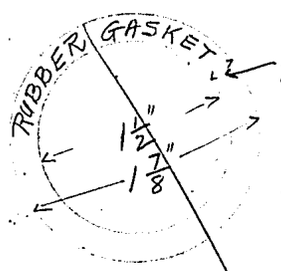


DIAPHRAGM IN ABOVE RECORDER is paper
DIAMETERS OF LAMINATIONS = $1\frac{5}{8}''$ $1\frac{9}{32}''$ $\frac{15}{16}''$ $\frac{5}{8}''$ $\frac{11}{32}''$
THICKNESS OF " = .006" .007" .005" .009" .010".
" " Gaskit - $\frac{58}{1000}$ - Width $\frac{3}{16}''$

Makes a loud full tone record and holds very good Mr E. says shows good overtones on back. will try same thing with Mica Dia. to see if it is quicker. Mr Ed. says nonica.

2/8/21

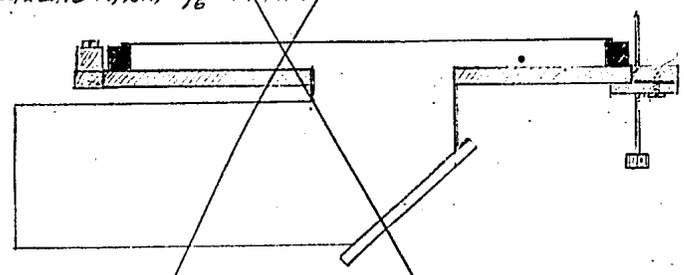
Recorder #7.

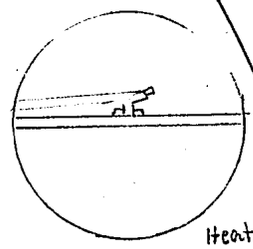


$\frac{3}{16}''$ WIDE.
$\frac{150}{1000}''$ THICK

DIAPHRAGM = PAPER
$\frac{6-8-14-16-19-''}{1000}$

WITH WIRE CONTROLL in Centre only -
REGULAR ARM $\frac{3}{16}''$ HIGH.

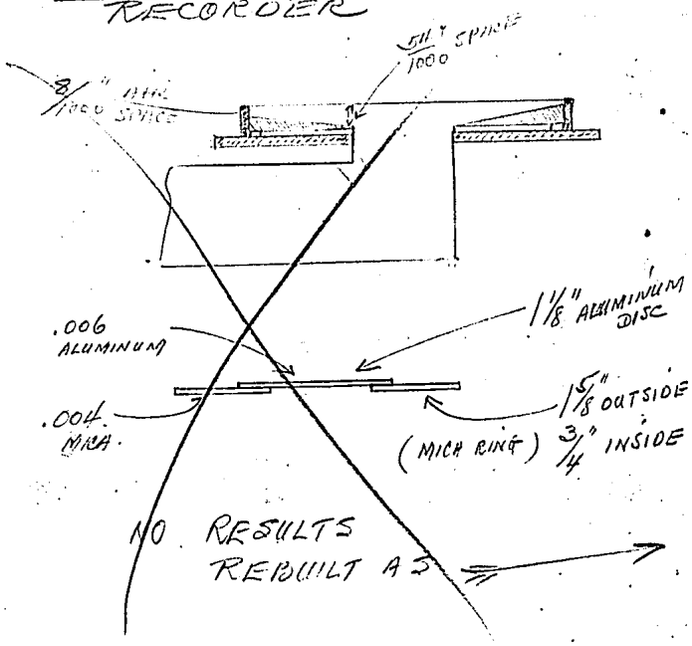




WATCH Spring
$\frac{2}{32}$ Wide .004 Thick.

Heated and layed on Dia. under neath in line with head " Arm.

DIAPHRAGM NO. 8.
RECORDER



NO RESULTS
REBUILT AS

See page 16

1/26/21 RECORDER #8

PRESSED PAPER DIA. #5

DIAMETERS. 1 5/8", 1 9/32", 15/16", 5/8", 11/32"

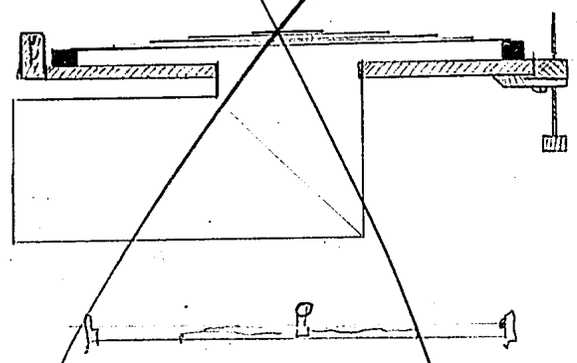
THICKNESS: 53/4" - 8/1000 - 14 - 16 - 17

RUBBER GASKET 7/16" WIDE

1 1/2"

1 7/8"

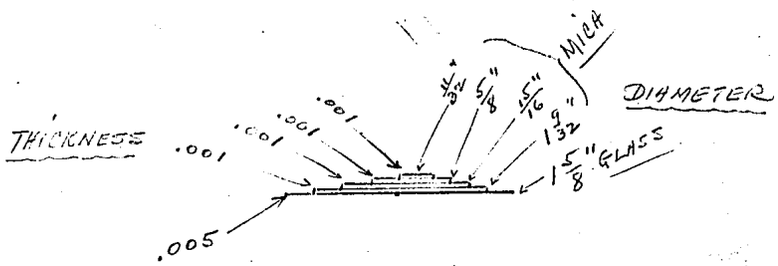
48/1000" THICK

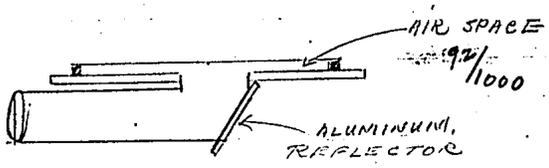


Cork in centre on foot.

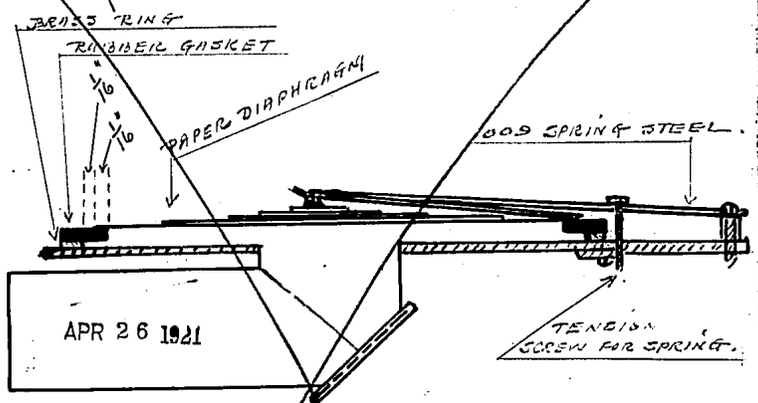
See Page 18

DIAPHRAGM NO. 9
RECORDER





Recorder #8.



APR 26 1921

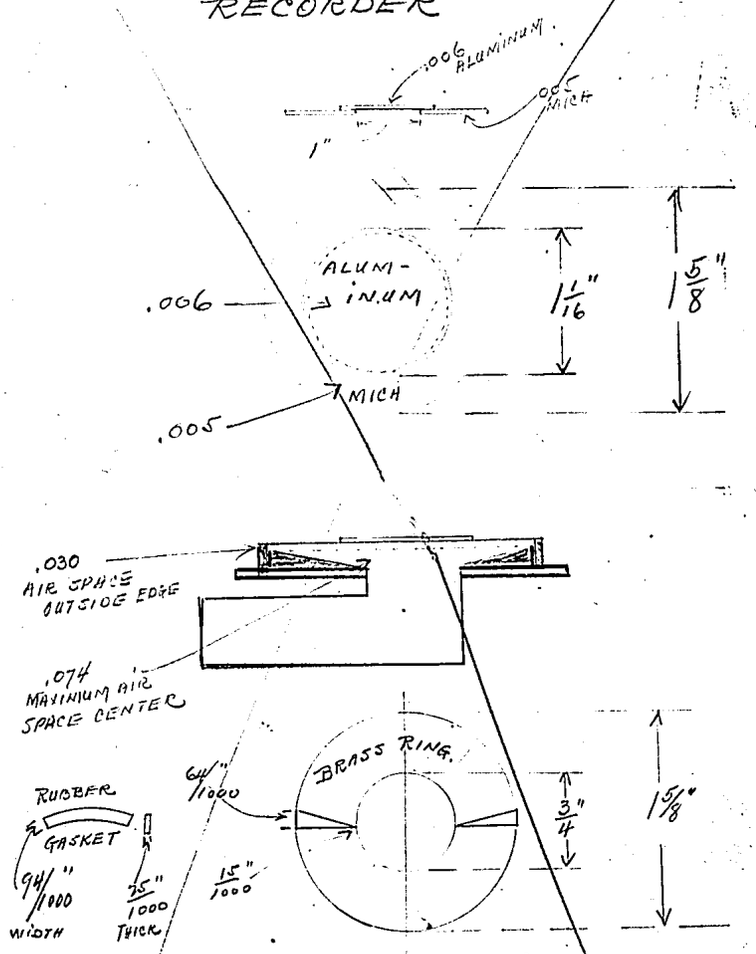
AIR SPACE .069"
RING = 2" OUTSIDE DIA. 1 3/4" INSIDE DIA. .031 THICK
RUBBER GASKET, = 1 7/8" OUTSIDE DIA. 1 1/2" INSIDE DIA. .038 THICK
PAPER DIAPHRAGM = 1 5/8" OUTSIDE DIA. (THICKNESS 7-8½-11½-14-16½
OVER HANG = 1/8" OF GASKET 1/16" OF DIAPHRAGM.

Overhang too much. Record full and soggy back in hour. Cut overhang in half.

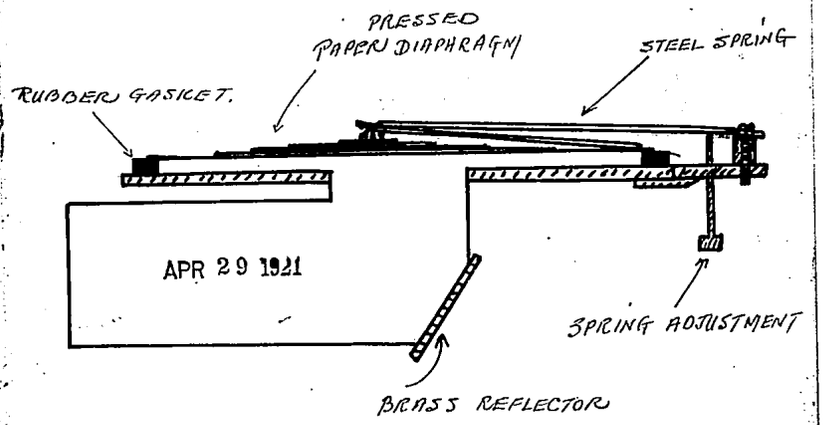
Rebuilt as above with overhang.

Paper Thick. ~~6-7-8-9-10~~ Hayes die No. 4 6-7-8-9-10
Gasket - 56/1000 - 3/16 wide. 1 5/8" 1 1/4" 1" 3/4" 1/2"

DIAPHRAGM NO. 10.
RECORDER



RECORDING DIAPHRAGM NO. 10.



PAPER DIAPHRAGM.

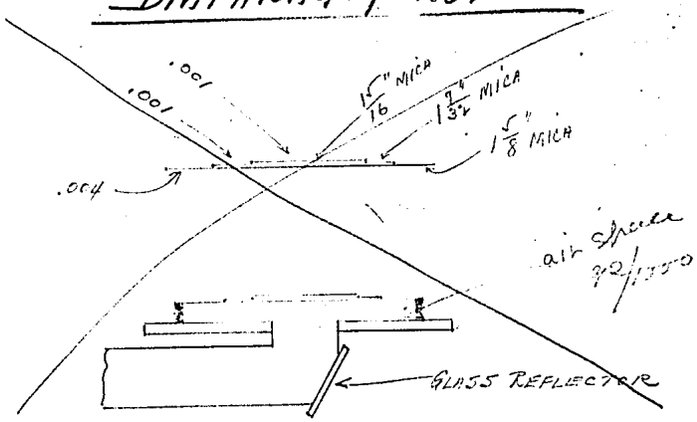
DIAMETERS OF LAMINATIONS $1\frac{5}{8}$" $1\frac{9}{32}$" $\frac{15}{16}$" $\frac{5}{8}$" $\frac{11}{32}$"

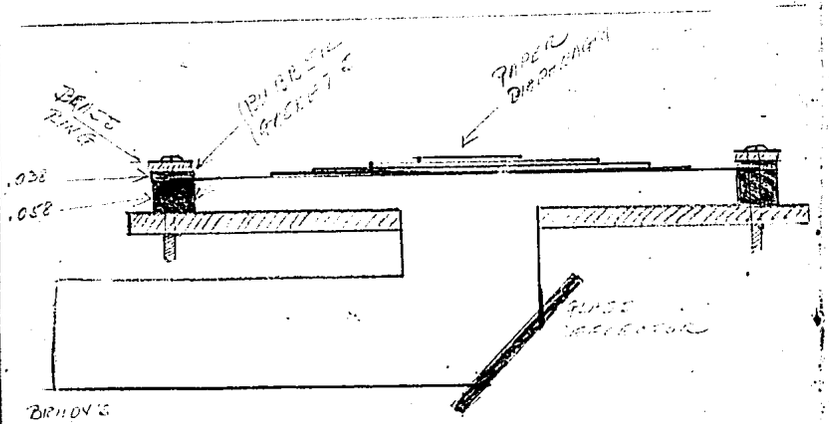
THICKNESS " " ~~.0075" .015" .013" .016" .018~~"
.006 - .001 - .001 - .001 - .001

RUBBER GASKET = .058" THICK $\frac{3}{16}$" WIDE.

AIR SPACE = .058"

DIAPHRAGM NO. 11.





BRIDON'S

PAPER DIA = .005 - .0075 - .014 - .016 - .0175

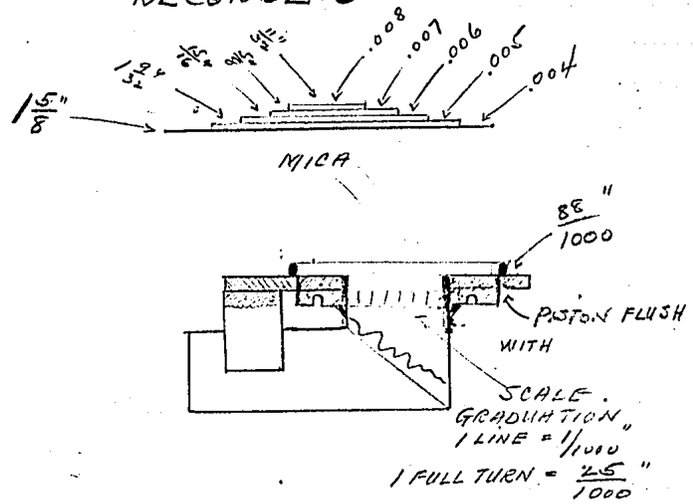
GASKETS = LOWER .058 X 3/16" UPPER .038 X 3/16"

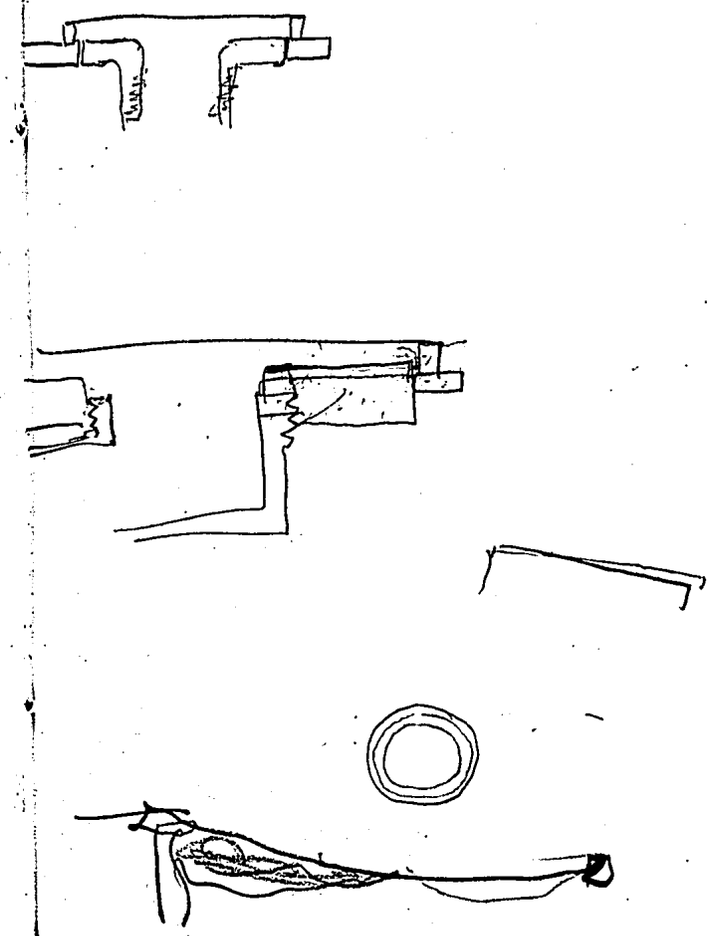
BRASS RING = 1½" INSIDE 1 7/8" OUTSIDE 3/16" WIDE 1/32" THK.

9 SCREWS FOR CLAMPING

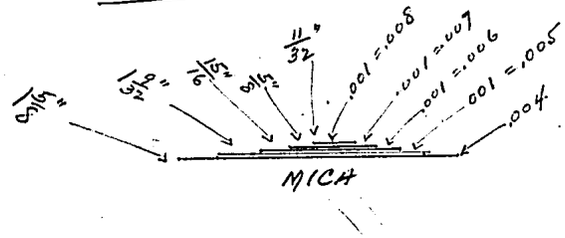
More control touching corn in center spot,

PISTON DIAPHRAGM NO. 12.
RECORDER

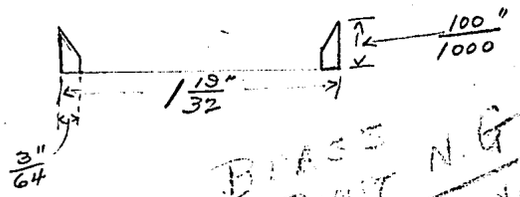




PISTON RECORDER NO. 13.



SAME FORM AS NO. 12
BUILT UP WITH BRASS KNIFE EDGE RING
INSTEAD OF RUBBER GASKET.

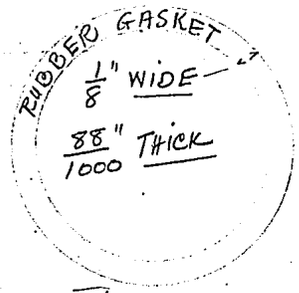


BRASS RING

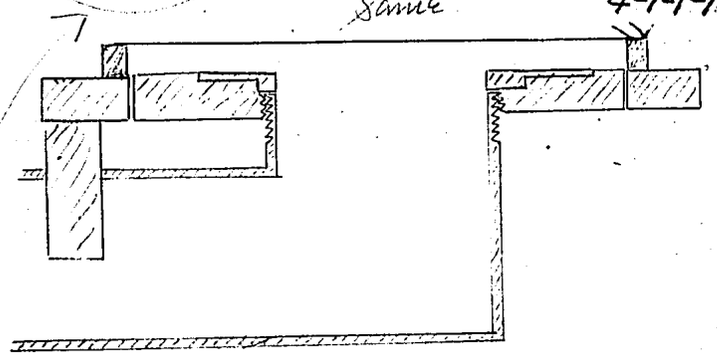
FULL AIR SPACE = 100"/1000

MICA DIA. WAXED ONTO KNIFE EDGE.

NO. 13. Dia.

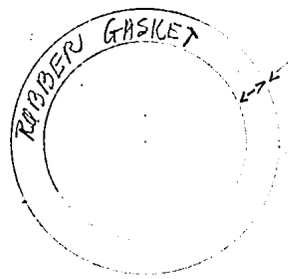


DIA = SAME AS
OPPOSITE PAGE 44 ONES
Made 5 trials with this gasket
88/1000 63/1000 38/1000 28/1000 18/1000
best Trials #1
Same 4-1-1-1-1



Tried the above with 3-1-1-1-1—
Mica dia - blotting paper brush L.G.

NO13. Dia.



3/16" WIDE

85/1000" THICK OR HIGH.

DIA. SAME AS ON PAGE 25, + 26

Trials #3

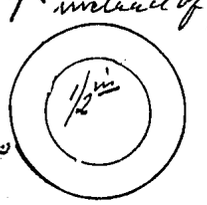
Made 5 trails with this gasket
85/1000 - 63/1000 - 38/1000 - 28/1000 - 18/1000
Best

McEdson says use this Gasket 3/16"

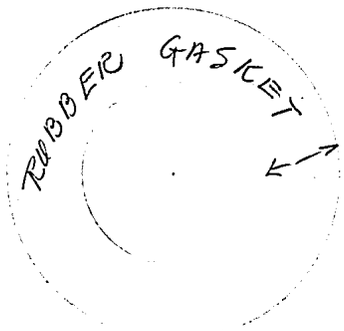
Tryed same as above only 1/2 hole in plate instead of 3/4

McEdson Seay's No.
Air Space

85/1000 63/1000 38/1000 28/1000 18/1000



Trials #5.



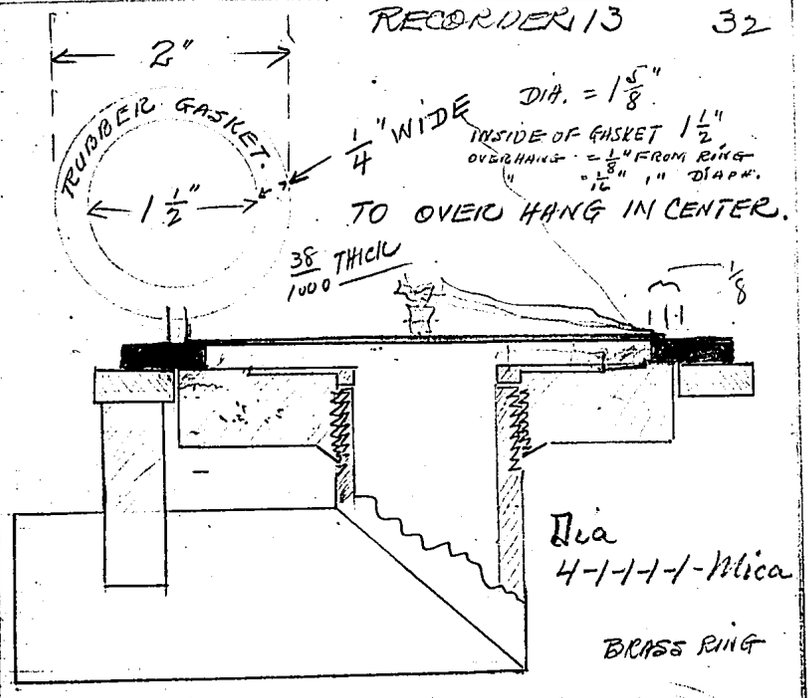
80/1000" THICK OR HIGH.

DIA, SAME AS USED ON PAGE 25-26-28

Made 5 trials with this gasket

80/1000 63/1000 38/1000 28/1000 18/1000 . Trials #4.

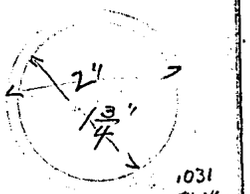
BEST



Trials #6.

5 Trials Air Space...

69/1000 59/1000 49/1000 39/1000



RECORDER #12 PRESSED PAPER DIAPHRAGM.

1000th thick → 10 12 14 16 5/8 15/16 15/8 1 9/32" ← Diameter in inches

Trials #7.

85/1000 63/1000 35/1000 25/1000 14/1000

AIR SPACE ↗ ↗

RUBBER GASKET ← 3/16" WIDE

← 1½ → 85/1000" THICK

Recorder #13 built same as on Page 32

Made trials with and without wire control.

Trials #8

Trials No 1-2- 59/1000 49/1000 without wire

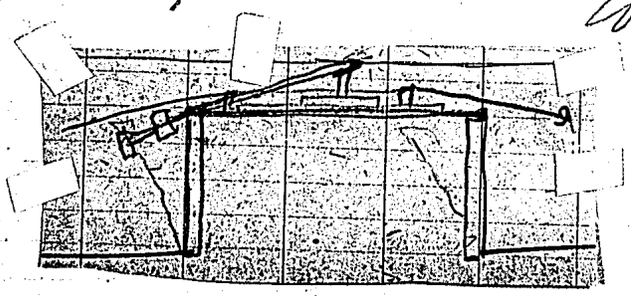
Trials #9

" " 3-4- 59/1000 49/1000 with wire

Wire control much better than without

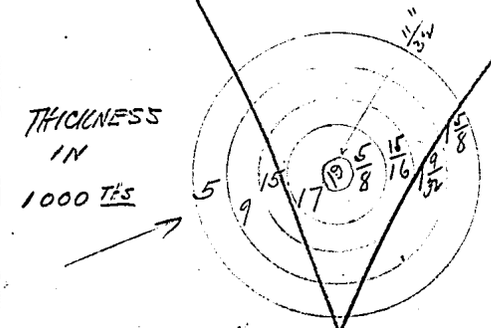
Mr Blubber. Mr Edison agrees on this but wants failure on end of Needle and tried to get same results.

W.



RECORDER #12

PAPER DIAPHRAGM.



Trials #10

1st	Air Space		85/1000
2	"	" Rect.	63/1000
3	"	"	38/1000
4	"	"	28/1000
5	"	"	[illegible]/1000

All very good Mr E. says.

RECORDER #13 -

BUILT SAME AS OVERHANG ON PAGE 32.

WITH NEEDLE ARM LOWERED TO $\frac{3}{32}$" INSTEAD OF $\frac{3}{16}$" AS SHOWN.

TRIALS #11

1st Trial Air Space .59/1000

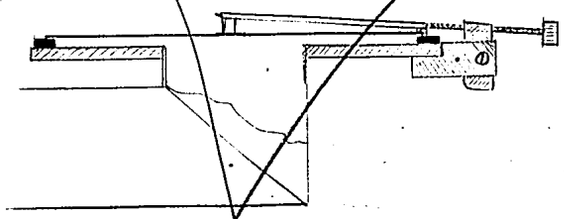
" " " .49/1000

Holds better than high arm.

W.

RECORDER NO. 1.

ADJUSTABLE STAY AT NEEDLE ARM END.



GASKET $\frac{3}{16}$" WIDE, $\frac{38}{1000}$" THICK.

DIAPHRAGM .004 - .001 - .001 - .001 - .001. MICA — LAYERS

DIAMETERS $1\frac{5}{8}$" $1\frac{9}{32}$" $\frac{15}{16}$" $\frac{5}{8}$" $\frac{11}{32}$.

TRIALS #12

Used Trials #13 instead [illegible] Hia.

NG.

RECORDER NO. 1. Same as on page 42

GASKET:- $\frac{1}{4}$" WIDE $\frac{80}{1000}$" THICK

DIAPHRAGM:- PRESSED PAPER

DIAMETERS:- $1\frac{5}{8}$" - $1\frac{9}{32}$" - $\frac{15}{16}$" - $\frac{5}{8}$" - $\frac{11}{32}$"

THICKNESS. - .008" - .011" - .012" - .014" - .015"

OTHERWISE SAME AS ON PAGE 42.

TRIALS #13. Jan 21/21

1st Trial — Did Fair

2nd " 55% Louder — With Wire and OK. Mr Edison says

3rd " Weak & Flubs — With Stay at end of Arm. Mr Edison

4th " No. " " " Tightener Weak.

35

45.

RECORDER #13

PRESSED PAPER DIA.
8 - 10 - 14 - 16 - - THOUSANDTHS
Reg ARM = $\frac{3}{16}$"
RUBBER GASKET OVER HANG (PAGE 37

TRIALS #14

1S TRIAL - Air Space 69/1000
2 " " " 59/1000
Weak.

46.

RECORDER #7

SEE PAGE 13 -

Trials #15.

Recorder #1.

1st Trial Rec #1 Air Space 58/1000

" " " " "

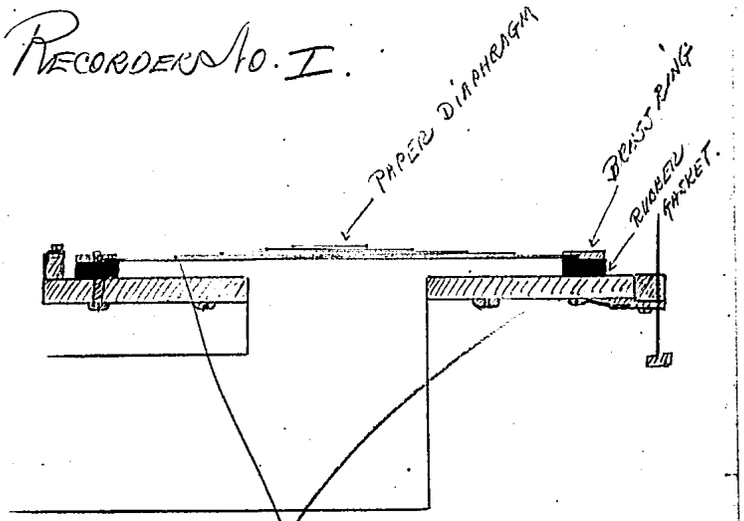
3 " Recorder #12

4 " " #7

Trials #16.

No 1 - Recorder adjusted louder. 1st Trial

RECORDER No. I.



RUBBER GASKET = $\frac{58}{1000}$" THICK $\frac{3}{16}$" WIDE.

PAPER DIA = $\frac{7-8-9-11-13}{1000}$" THICK.

BRASS RING = $1\frac{1}{2}$" INSIDE $1\frac{7}{8}$" OUTSIDE $\frac{3}{16}$" WIDE. $\frac{45}{1000}$" THICK, 4 SCREW HOLES FOR CLAMPING —

Found this to thin no overtones

See next page.

Recorder #1.

Rebuilt with Air Space 58/1000

Paper dia - 3-7-10-16-16.—

38/1000 Rubber gaskit over dia.

Clamped with brass Ring see page 48.

Dia. loose between gaskits

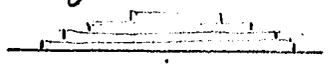
to Smithson could not control it even with Incir 11 ft. away.

Recorder #13 Trial #7

Overhanging Gaskit.

Built same as on page 32

only change in Dia.



Using mica for first layer then paper

4-8-11-13-15. with loose control.

1st Trial Air Space 49/1000

2nd " " " " Less Tention

3 " " " " " "

Mr Edison says very good.

Don change this Recorder

Aug 7/21

Recorder #1. Trials #18
see page 49.

With Hia fastener with Rubber cement
and wire control in center
Clamped with Ring 4-screws.

1st Trial Air Space 58/1000

2 " " " " less tension

3 " " " " " "

(Mr Ed. says good kind Cus
Recorder.)

Paper Hia. 5-7-10-15-16.

Trials #19
Recorder #6. Page 11-

1st Trial Air Space 88/1000

2 " " " " Less tension

All very Good.

2/15/20

#11 Trials #20

See page #21 Air Space 58/1000

1st Trial Rec. # 11

2 " " #11

3 " Rec. #1.

4 " " #1.

All Good.

Dia. 5-7½ [illegible]
Gaskit 58/1000 [illegible] 38/1000
9-bolts.-Ring-Same as page 48.

2/15/20 OVERHANGING GASKET.

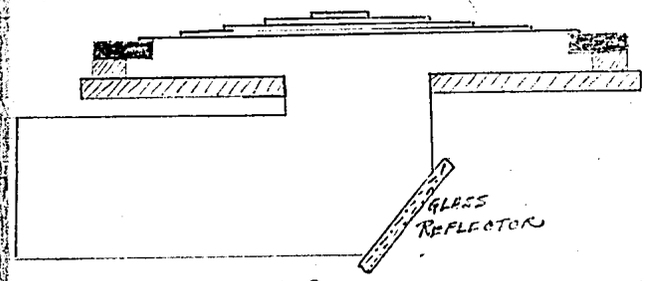
RECORDER NO. 2.

BRADY PAPER DIAPHRAGM = $\frac{5-8-13\frac{1}{2}-16-18}{1000}$ "

BRASS RING = $\frac{55}{1000}$" THICK $1\frac{11}{16}$" INSIDE 2" OUTSIDE

RUBBER GASKET = $\frac{75}{1000}$" THICK $1\frac{1}{2}$" INSIDE 2" OUTSIDE.

OVERHANG = $\frac{3}{32}$"



H. G. W.

Feb. 16/21

Recorder #8. See page 16.

Trials #1 - Gai Sheer 48/100

" #2. " "

Trials #21.

Recorders #1 - #11 - #2

all clamped with Ring.

1st Trial Rec. #2 - Page 4

2 " " #11 - Page 21

3 " " #1. Page 51

Trials #22.

Ref. 23

Recorded 2. Lautrec Pierre 7/6.

See page 8.

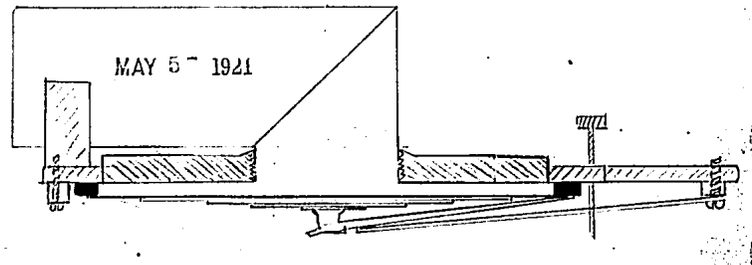
Trials 23.

Lead or 7/6.

May 6th/21.

Recorder #12

ADJUSTABLE AIR SPACE.



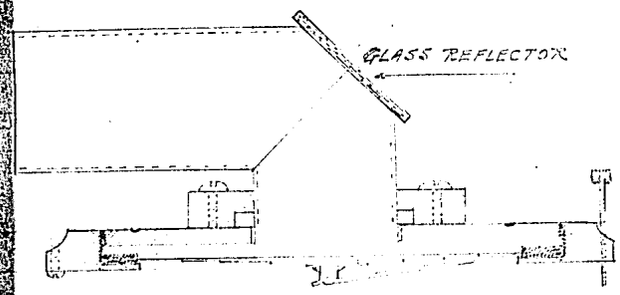
$1\frac{5}{8}$ $1\frac{1}{8}$ $\frac{3}{4}$ $\frac{1}{2}$ = 5 8 10 11 / 5 3 2 1

Paper Dia #18 / Hayes Dia 5 Gasket 83 [illegible] 3/16 [illegible].

Work Spring same as #7.

RECORDER NO. 15.

CLAMPED ARRANGEMENT.



DIAMETERS $1\frac{5}{8}$ $1\frac{3}{8}$ $1\frac{1}{8}$ $\frac{7}{8}$ $\frac{5}{8}$ 15 17 10 9 6 THICKNESS IN $\frac{}{1000}$ THS.

PAPER DIAPHRAGM

RUBBER GASKET

LOWER $\frac{31}{1000}$" UPPER $\frac{55}{1000}$"

[ITEM(S) FOUND IN BOOK]

Recorders for Weak Voices

30
.024 st Use when not to be Amplified

2 - Loud & full

9 - Loud. as #2 - but thinner tone.

July 1/14.

Test of Recorders at 18 feet -
2 long arm

Dia. # 50 - Loud at set high on 1st slot
" 6
" 2 About as loud fuller tone.
" 40 " " " as #50 fuller tone
" 8
" 11
" 10
" 30
" 7 all others weaker.

[ITEM(S) FOUND IN BOOK]

(162)

July [illegible]

Rec[illegible] with. 524 Digitalis

80 – Most – [illegible]

50 – [illegible] 4

40 – [illegible]

30 – [illegible] 30 [illegible] shows [illegible] to be cured.

30 Shade weaker than to Holdsworth

[ITEM(S) FOUND IN BOOK]

12/17/15 to

Recorder

F. C. Best.

[ITEM(S) FOUND IN BOOK]

Dec. 17-1915

Shellacked records.

73 } made up same as
77 } #65. –
69 } Stock .0007 Japan paper
Shellacked .001.
$\frac{15}{16}$ x .0015 aluminum center.

Tested Dec. 18 - P.M. by Mr. Keeney
Only fair.
73 not returned for rebinding.

77 }
76 } returned for rebinding.
69 } (see next page for test)

[ITEM(S) FOUND IN BOOK]

Dec. 20/45

Stretched Ranier.

#77 Japanese paper - .003
coated thin shellac, then thin varnish
centre aluminum 3/4 dia x .006
needle arms same size.

76. Same as 77. ~~not tried~~
~~same as needle~~.

Tested 1/23/45

69. same as 77.

Tested 1/30/45 Very fine quality
but not loud enough for
F.A.6. (surface not bad).

Rebuilt

[ITEM(S) FOUND IN BOOK]

Dec. 21/15

*77 Stretched.
made arm changed to
standard arm for drawing.

Tested [illegible] good quality & [illegible]
than any others.
Only change from previous
test ([illegible] tops & shellacked
back grain in [illegible] direction.)

Use personal instruction.
*70 Old Style head.
Built up .002 mica
wax way, 1 gasket.

Tested - Fairly good. (rough surface.)

*70 Old Style —
same as above with
aluminum centre 5/16 x .003.

Tested - better surface & bit louder,

*69 Stretched —
Stock top paper .0007.
Shellacked .001.
Aluminum — 15/16 x .0015.
} N.G.

[ITEM(S) FOUND IN BOOK]

Dec 22, 1915

*105 Old Style head
Built old way.
~~[illegible]~~ .001 mica waved gasket
.001 x 5/16 aluminum centre.

Tested 50% Weaker than - N. G.

Dec. 23. 1915

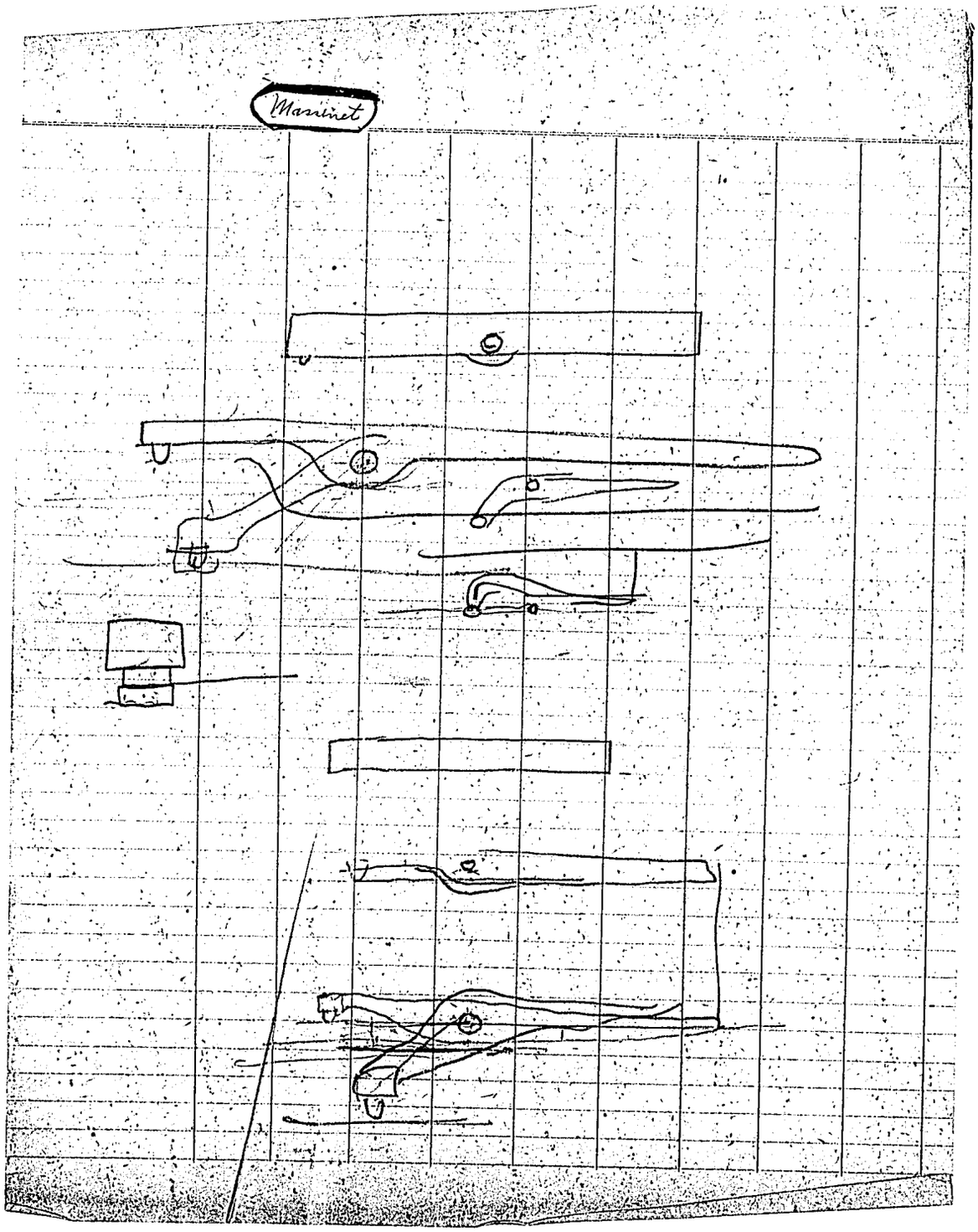
*69 (Rebuilt)

[ITEM(S) FOUND IN BOOK]

Mr. Lauter. Feb. 25/21

Rec'd 6 -

Home 13 - on Ref. Power.

Home on Receding Wave 6 ft. 3½ in width.

[ITEM(S) FOUND IN BOOK]